

**CHAPTER 24.1-06-05
SPECIAL OCCUPANCIES**

Section

24.1-06-05-01	(NEC 500) Hazardous Locations
24.1-06-05-02	[Reserved]
24.1-06-05-03	[Reserved]
24.1-06-05-04	[Reserved]
24.1-06-05-05	[Reserved]
24.1-06-05-06	[Reserved]
24.1-06-05-07	[Reserved]
24.1-06-05-08	[Reserved]
24.1-06-05-09	[Reserved]
24.1-06-05-10	[Reserved]
24.1-06-05-11	[Reserved]
24.1-06-05-12	[Reserved]
24.1-06-05-13	[Reserved]
24.1-06-05-14	[Reserved]
24.1-06-05-15	[Reserved]
24.1-06-05-16	[Reserved]
24.1-06-05-17	[Reserved]
24.1-06-05-18	[Reserved]
24.1-06-05-19	[Reserved]
24.1-06-05-20	[Reserved]
24.1-06-05-21	[Reserved]
24.1-06-05-22	[Reserved]
24.1-06-05-23	[Reserved]
24.1-06-05-24	[Reserved]
24.1-06-05-25	[Reserved]
24.1-06-05-26	[Reserved]
24.1-06-05-27	[Reserved]
24.1-06-05-28	[Reserved]
24.1-06-05-29	[Reserved]
24.1-06-05-30	[Reserved]
24.1-06-05-31	[Reserved]
24.1-06-05-32	[Reserved]
24.1-06-05-33	[Reserved]
24.1-06-05-34	[Reserved]
24.1-06-05-35	[Reserved]
24.1-06-05-36	[Reserved]
24.1-06-05-37	[Reserved]
24.1-06-05-38	[Reserved]
24.1-06-05-39	[Reserved]
24.1-06-05-40	[Reserved]
24.1-06-05-41	[Reserved]
24.1-06-05-42	[Reserved]
24.1-06-05-43	[Reserved]
24.1-06-05-44	[Reserved]
24.1-06-05-45	[Reserved]
24.1-06-05-46	[Reserved]
24.1-06-05-47	[Reserved]
24.1-06-05-48	[Reserved]
24.1-06-05-49	[Reserved]
24.1-06-05-50	(NEC 550) Mobile Home Parks

24.1-06-05-01. (NEC 500) Hazardous locations.

1. Classification of hazardous locations is required to be completed by owner, representative, or engineer that has the qualifications and shall provide documentation as required by the provisions of article 500.4, 2017 edition, National Electrical Code through December 31, 2020, and article 500.4, 2020 edition, National Electrical Code thereafter, including the reference standards as listed in article 500.4, 2017 edition, National Electrical Code through December 31, 2020, and article 500.4, 2020 edition, National Electrical Code thereafter.
2. For classifications of oilfield installations refer to API RP 500, Classification of Locations for Electrical Installations at Petroleum Facilities, third edition, December 2012.
3. Surge arrestors shall be provided for all services in grain elevators.
4. Hot bearing or other similar detection systems shall be installed in accordance with articles 500-516, 2017 edition, National Electrical Code through December 31, 2020, and articles 500-516, 2020 edition, National Electrical Code thereafter.

History: Effective April 1, 2017; amended effective October 1, 2020.

General Authority: NDCC 43-09-05

Law Implemented: NDCC 43-09-21, 43-09-22

24.1-06-05-02. [Reserved].

24.1-06-05-03. [Reserved].

24.1-06-05-04. [Reserved].

24.1-06-05-05. [Reserved].

24.1-06-05-06. [Reserved].

24.1-06-05-07. [Reserved].

24.1-06-05-08. [Reserved].

24.1-06-05-09. [Reserved].

24.1-06-05-10. [Reserved].

24.1-06-05-11. [Reserved].

24.1-06-05-12. [Reserved].

24.1-06-05-13. [Reserved].

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24.1-06-05-19. [Reserved].

24.1-06-05-20. [Reserved].

24.1-06-05-21. [Reserved].

24.1-06-05-22. [Reserved].

24.1-06-05-23. [Reserved].

24.1-06-05-24. [Reserved].

24.1-06-05-25. [Reserved].

24.1-06-05-26. [Reserved].

24.1-06-05-27. [Reserved].

24.1-06-05-28. [Reserved].

24.1-06-05-29. [Reserved].

24.1-06-05-30. [Reserved].

24.1-06-05-31. [Reserved].

24.1-06-05-32. [Reserved].

24.1-06-05-33. [Reserved].

24.1-06-05-34. [Reserved].

24.1-06-05-35. [Reserved].

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24.1-06-05-41. [Reserved].

24.1-06-05-42. [Reserved].

24.1-06-05-43. [Reserved].

24.1-06-05-44. [Reserved].

24.1-06-05-45. [Reserved].

24.1-06-05-46. [Reserved].

24.1-06-05-47. [Reserved].

24.1-06-05-48. [Reserved].

24.1-06-05-49. [Reserved].

24.1-06-05-50. (NEC 550) Mobile home parks.

Service equipment may be installed on manufactured homes as required in article 550.32(b) if the following requirements are met:

1. The mobile home is located on property owned by the homeowner and not in mobile home park.
2. The mobile home is secured to a permanent foundation that complies with locally adopted codes or the State Building Code.

History: Effective April 1, 2017; amended effective October 1, 2020.

General Authority: NDCC 43-09-05

Law Implemented: NDCC 43-09-21, 43-09-22

APPENDIX

Short Cut
At 75° C

Voltage Drop Formulas 167° F

$$\text{Voltage drop} = \frac{K \times L \times I}{CMA}$$

$$CMA = \frac{K \times L \times I}{\% \text{ drop } \times \text{ voltage}}$$

$$\text{Length} = \frac{CMA \times \text{Voltage drop}}{K \times I}$$

$$\text{Area of circle} = \pi r^2$$

L = length in feet, one way

I = load in amps

E = Volts

CMA = circular-mil area

K-factor = 25.8 multiplying factor for copper, 42.4 multiplying factor for aluminum at 75° C.

For three-phase circuits, use formula, then multiply the results by .86

Percent drop permissible voltage drop times voltage of circuit as follows:

5% of 120 120 x .05 = 6 volts

5% of 208 208 x .05 = 10.4 volts

5% of 240 240 x .05 = 12 volts

Examples with copper wire:

240 volts, 1,000 foot distance, 10 ampere load, 5% volt drop maximum

$$\text{CMA} = \frac{25.8 \times 1000 \times 10}{.05 \times 240}$$

= 21,500 CMA minimum = #6 cu minimum

Same values as above but use #8 copper wire instead

$$\text{Voltage drop} = \frac{25.8 \times 1000 \times 10}{16510}$$

= 15.6 volts/240 = 6.5% volt drop

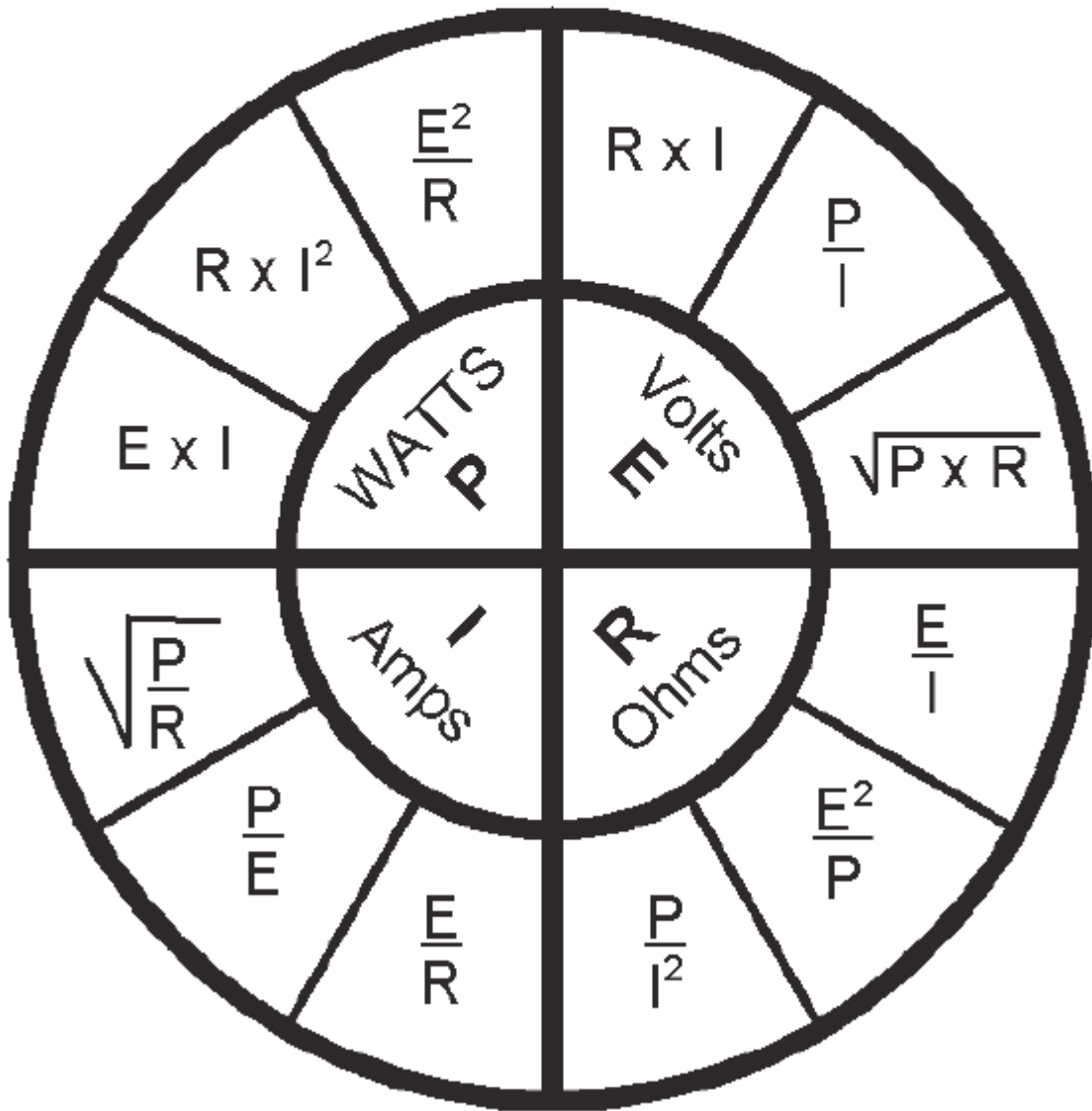
120 volts, 8 ampere load, 100 foot distance, 3% volt drop maximum

$$\text{CMA} = \frac{25.8 \times 100 \times 8}{.03 \times 120}$$

= 5733 CMA minimum = #12 cu minimum

Refer to Chapter 9 Table 8 of NEC for conductor properties

OHM'S LAW



Means of Egress Condensed Guide

1. Marking of means of egress. All required exits and access to exits shall be marked by readily visible signs. For externally illuminated signs, letters shall be not less than six inches [150 millimeters] high. Internally illuminated signs shall be listed per ANSI/UL 924 which assures proper letter size. Chevron-shaped arrows are required to indicate direction to exits. Every sign shall be suitably illuminated. For externally illuminated signs see subsection 7.10.6, Life Safety Code®, NFPA 101, 2015 edition through December 31, 2020, and subsection 7.10.6, Life Safety Code®, NFPA 101, 2018 edition thereafter and for internally illuminated signs see subsection 7.10.7.
2. Illumination of means of egress. Illumination of means of egress shall provide continuous, dependable, illumination of not less than one foot-candle at floor level for all areas such as corridors, stairways, and exit doorways, providing a lighted path of travel to the outside of the building and public way during all times that the means of egress is available for use. For new stairs, the required minimum illumination level is ten foot-candle during conditions of stair use. Illumination shall be from a source of reasonable assured reliability and may be supplied from normal lighting circuits or special circuits with switching controlled by authorized personnel. Illumination required for exit marking shall also serve for illumination of means of egress and shall be so arranged that failure of a single unit, such as burning out of a single bulb will not leave any area in darkness.
3. Emergency lighting. Emergency lighting systems shall be so arranged to provide the required illumination automatically in event of any interruption or failure of the normal power supply. An acceptable alternate source of power may be an electric generator or approved battery. In occupancies where emergency lighting is required, the circuits supplying exit marking and illumination of means of egress shall be supplied by the emergency system. Other areas of the facilities only requiring exit marking and illumination of means of egress may be supplied by the normal source.
4. Classification of occupancy based on chapter 6, Life Safety Code®, NFPA 101, 2015 edition through December 31, 2020, and chapter 6, Life Safety Code®, NFPA 101, 2018 edition thereafter.

Note: Check with local building officials to determine occupancy and occupant load.

Assembly. Assembly occupancies include all buildings or portions of buildings used for gathering together fifty or more persons for such purposes as deliberation, worship, entertainment, eating, drinking, amusement, or awaiting transportation. Assembly occupancies also include special amusement buildings regardless of occupant load.

Assembly occupancies might include the following:

Armories	Libraries
Assembly halls	Mortuary chapels
Auditoriums	Motion picture theaters
Bowling lanes	Museums
Clubrooms	Passenger stations and terminals of air, surface, underground, and marine public transportation facilities
Colleges and university	Places of religious worship
Classrooms, fifty persons and over	Poolrooms
Conference rooms	Recreation piers
Courtrooms	Restaurants

Dance halls
Drinking establishments
Exhibition halls

Skating rinks
Theaters
Gymnasiums

Occupancy of any room or space for assembly purposes by fewer than fifty persons in a building or other occupancy and incidental to such other occupancy shall be classified as part of the other occupancy and shall be subject to the provisions applicable thereto.

Educational. Educational occupancies include all buildings or portions of buildings used for educational purposes through the twelfth grade by six or more persons for four or more hours per day or more than twelve hours per week.

Educational occupancies include the following:

Academies
Kindergartens

Schools

Other occupancies associated with educational institutions shall be in accordance with the appropriate part of Life Safety Code®, NFPA 101, 2015 edition through December 31, 2020, and Life Safety Code®, NFPA 101, 2018 edition thereafter.

In cases when instruction is incidental to some other occupancy, the section of Life Safety Code®, NFPA 101, 2015 edition through December 31, 2020, and Life Safety Code®, NFPA 101, 2018 edition thereafter, governing such other occupancy applies. For example:

College and university classrooms under fifty persons - business occupancy
College and university classrooms fifty persons and over - assembly
Instructional building - business occupancy
Laboratories, instructional - business occupancy
Laboratories, noninstructional - industrial

Day care. Day care occupancies include all buildings or portions of buildings in which four or more clients receive care, maintenance, and supervision, by other than their relatives or legal guardians, for less than twenty-four hours per day.

Day care occupancies include the following:

Child day care occupancies
Adult day care occupancies, except where part of a health care occupancy
Nursery schools
Day care homes
Kindergarten classes that are incidental to a child day care occupancy

In areas when public schools offer only half-day kindergarten programs, many child day care occupancies offer state-approved kindergarten classes for children who require full day care. As these classes are normally incidental to the day care occupancy, the requirements of the day care occupancy should be followed.

Health care. Health care occupancies are those used for purposes such as medical or other treatment or care of persons suffering from physical or mental illness, disease, or infirmity and for the care of infants, convalescents, or infirm aged persons. Health care occupancies provide sleeping facilities for four or more occupants and are occupied by persons who are mostly incapable of self-preservation

because of age, physical or mental disability, or because of security measures not under the occupants' control.

Health care occupancies include the following:

- Hospitals
- Nursing homes
- Limited care facilities

Ambulatory health care. Ambulatory health care occupancies are those used to provide services or treatment simultaneously to four or more patients on an outpatient basis. The patients are considered incapable of self-preservation due to the treatment rendered, the use of anesthesia, or the injury for which they are receiving emergency or urgent care.

Detention and correctional. Detention and correctional occupancies are used to house individuals under varied degrees of restraint or security and are occupied by persons who are mostly incapable of self-preservation because of security measures not under the occupants' control.

Detention and correctional occupancies include the following:

- Adult and juvenile substance abuse centers
- Adult and juvenile work camps
- Adult community residential centers
- Adult correctional institutions
- Adult local detention facilities
- Juvenile community residential centers
- Juvenile detention facilities
- Juvenile training schools

Residential. Residential occupancies are those occupancies in which sleeping accommodations are provided for normal residential purposes and include all buildings designed to provide sleeping accommodations.

Exception. Those classified under health care or detention and correctional occupancies.

Residential occupancies are treated separately in Life Safety Code®, NFPA 101, 2015 edition through December 31, 2020, and Life Safety Code®, NFPA 101, 2018 edition thereafter, in the following groups:

- One-family and two-family dwelling unit
- Lodging or rooming house
- Hotels
- Dormitory
- Apartment building
- Residential board and care occupancy

Mercantile occupancy. An occupancy used for the display and sale of merchandise.

Mercantile occupancies include the following:

- | | |
|-------------------|---|
| Auction rooms | Restaurants with fewer than fifty persons |
| Department stores | Shopping centers |
| Drugstores | Supermarkets |

Office, storage, and service facilities incidental to the sale of merchandise and located in the same building should be considered part of the mercantile occupancy.

Business. Business occupancies are those used for the transaction of business other than those covered under mercantile.

Business occupancies include the following:

Air traffic control towers (ATCTs)	Doctors' offices
City halls	Townhalls
College and university instructional buildings, classrooms under fifty persons, and instructional laboratories	General offices
Courthouses	Outpatient clinics, ambulatory
	Dentists' offices

Doctors' and dentists' offices are included unless of such character as to be classified as ambulatory health care occupancies.

Industrial. Industrial occupancies include factories making products of all kinds and properties devoted to operations such as processing, assembling, mixing, packaging, finishing or decorating, and repairing.

Industrial occupancies include the following:

Dry cleaning plants	Power plants
Factories of all kinds	Pumping stations
Food processing plants	Refineries
Gas plants	Sawmills
Hangars (for servicing or maintenance)	Telephone exchanges
Laundries	

In evaluating the appropriate classification of laboratories, the authority having jurisdiction should determine each case individually based on the extent and nature of the associated hazards. Some laboratories may be classified as occupancies other than industrial, for example, a physical therapy laboratory or a computer laboratory.

Storage. Storage occupancies include all buildings or structures utilized primarily for the storage or sheltering of goods, merchandise, products, vehicles, or animals.

Storage occupancies include the following:

Barns	Hangars (for storage only)
Bulk oil storage	Parking structures
Cold storage	Warehouses
Freight terminals	Truck and marine terminals
Grain elevators	

Storage occupancies are characterized by the presence of relatively small numbers of persons in proportion to the area. Any new use that increases the number of occupants to a figure comparable with other classes of occupancy changes the classification of the building to that of the new use.

Multiple occupancies. A building or structure in which two or more classes of occupancy exists shall be classified as a multiple occupancy. Multiple occupancies shall be protected either as mixed occupancies or as separated occupancies, in accordance with subsection 6.1-14.3 or 6.1-14.4, respectively, of Life Safety Code®, NFPA 101, 2015 edition through December 31, 2020, and Life Safety Code®, NFPA 101, 2018 edition thereafter. Where exit access from an occupancy traverses another occupancy, the multiple occupancy shall be protected as a mixed occupancy. In implementing the mixed occupancies form of protection, the building shall comply with the most restrictive requirements of the occupancies involved, unless separate safeguards are approved.

5. Occupant load factor table.

Use	Square Feet per Person
Assembly use - less concentrated use	15 net*
Areas of concentrated use without fixed seating	7 net*
Waiting space	3 net*
Bleachers, pews, and similar bench-type seating	Note 1
Fixed seating	Note 2
Kitchens	100 gross**
Libraries	
In stack areas	100 gross**
In reading rooms	50 net*
Swimming pools	
Water surface	50 gross**
Pool decks	30 gross**
Exercise rooms with equipment	50 gross
Exercise rooms without equipment	15 gross
Lighting and access catwalks, galleries, and gridirons	100 net
Casinos and similar gaming areas	11 gross
Skating rinks	50 gross
Stages	15 net*
Educational use	
Classroom area	20 net*
Shops, laboratories, and similar vocational areas	50 net*
Day care use	
Maximum number of persons intended to occupy that floor, but not less than	35 net*
Health care use	
Sleeping departments	120 gross**
Inpatient departments	240 gross**
Ambulatory health care	150 gross**
Detention and correctional use	

Maximum number of persons intended to occupy that floor, but not less than	120 gross**
Residential use	
Hotels, motels, dormitories, apartment buildings:	
Maximum probable population, but not less than	200 gross**
Residential board and care use	Note 3
Mercantile use (including malls)	
Street level and below (sales)	30 gross**
Sales area on two or more street floors	40 gross
Upper floor (sales)	60 gross**
Storage, receiving, or shipping (not open to the general public)	300 gross**
Assembly areas	See "Assembly"
Business use (other than below)	150 gross**
Concentrated business use	50 gross**
Air traffic control tower observation levels	40 gross**
Collaboration rooms/spaces ≤ 450 ft ² (41.8 m ²) in area	30gross
Collaboration rooms/spaces > 450 ft ² (41.8 m ²) in area	15 gross
Other purposes	Note 4
Industrial use	
General and high hazard industrial	100 gross**
Special purpose industrial	N/A
Storage use	
In storage occupancies	N/A
In mercantile occupancies	300 gross**
In other than storage and mercantile occupancies	500 gross**

* Net floor area is the actual occupied area, not including accessory unoccupied areas or thickness of walls.

** Gross floor area is the floor area within the inside perimeter of the outside walls of the building under consideration with no deduction for hallways, stairs, closets, thickness of interior walls, columns, or other features.

Notes to occupant load table.

Note 1. Bleachers, pews, and similar bench-type seating: one person per eighteen linear inches.

Note 2. Fixed seating. The occupant load of an area having fixed seats shall be determined by the number of fixed seats installed. Required aisle space serving the fixed seats shall not be used to increase the occupant load.

Note 3. Refer to chapters 32 and 33 of Life Safety Code®, NFPA 101, 2015 edition through December 31, 2020, and chapters 32 and 33 of Life Safety Code®, NFPA 101, 2018 edition thereafter.

Note 4. Occupant load factors associated with the use.

6. Building classification table.

x - indicates required

o - indicates not required

Occupancy	Marking of Means Egress	Illumination of Means Egress	Emergency Lighting
Assembly	x	x	x
Educational	x	x	x
Day care	x	x	x
Interior stairs and corridors	x	x	x
Assembly use spaces	x	x	x
Flexible and open plan buildings	x	x	x
Interior or limited access portions of buildings	x	x	x
Shops and laboratories	x	x	x
Family day care homes (more than three but fewer than seven persons)	o	x	o
Group day care homes (seven to twelve persons)	o	x	o
Health care occupancies (Note 1) (for complete details see article 517 of NEC and NFPA standard 99)	x	x	x
Detention and correctional	x	x	x
Residential			
Hotels and dormitories	x	x	x Note 2
Apartment buildings			
Twelve or less apartments	x	x	o Note 3
More than twelve apartments or greater than three stories in height	x	x	x Note 3
Residential board and care			
More than sixteen residents	x	x	x Note 2
Mercantile			
Class A - Over thirty thousand square feet [2787.09 square meters] or greater than three stories	x	x	x
Class B - Three thousand square feet to thirty thousand square feet [278.71 square meters to 2787.09 square meters] or three thousand square feet [278.71 square meters] or less and two or three stories	x	x	x
Class C - Under three thousand square feet [278.71 square meters] and one story	x Note 5	x	o
Malls	x	x	x
Business	x	x	o
Three or more stories in height	x	x	x
Fifty or more persons above or below level of exit discharge	x	x	x

Three hundred or more persons	x	x	x
All limited access and underground	x	x	x
Industrial	x	x Note 6	x Note 6 and 7
Storage	x	x Note 8	x Note 8 and 9

Special structures (refer to chapter 11, Life Safety Code®, NFPA 101, 2015 edition through December 31, 2020, and chapter 11, Life Safety Code®, NFPA 101, 2018 edition thereafter).

Mixed occupancies (Note 5).

NOTES:

Note 1. Exception: Power supply for exit and emergency lighting shall conform to NFPA 110.

Note 2. Exception: Where each guest room, guest suite, or resident sleeping room has an exit direct to the outside of the building at street or ground level emergency lighting is not required.

Note 3. Exception: Buildings with only one exit need not be provided with exit signs.

Note 4. Exception: Where the same means of egress serve multiple use or combined occupancies, exit lighting, exit signs, and emergency lighting shall be provided for the occupancy with the most stringent lighting requirements. The occupant load of each type of occupancy shall be added to arrive at the total occupant load.

Note 5. Exception: Where an exit is immediately apparent from all portions of the sales area, the exit marking is not required.

Note 6. Exception: Special purpose industrial occupancies without routine human habitation.

Note 7. Exception: Structures occupied only during daylight hours, with skylights or windows arranged to provide the required level of illumination on all portions of the means of egress during these hours.

Note 8. Exception: Storage occupancies do not require emergency lighting when not normally occupied.

Note 9. Exception: In structures occupied only during daylight hours, with skylights or windows arranged to provide the required level of illumination of all portions of the means of egress during these hours, emergency lighting is not required.

Fire Alarm System Condensed Guide

All signaling devices for all occupancies shall meet Americans with Disabilities Act (ADA) requirements (check ADA requirements).

Smoke alarms in hotels, motels, and apartments are not to be tied to the central alarm system (alarm in room or apartment only).

Central alarm trouble indicator shall be located where it will be heard.

Systems with two or more zones shall have an annunciator panel located at an entrance approved by the local fire department.

Cities shall have additional or more stringent requirements.

Be aware the table is the minimum and the owner or designer shall ask for more.